INCH-POUND

DFP 381
25 January 1999

DESCRIPTION FOR PURCHASE

SHOP SET, WELDING, TRAILER MOUNTED

1. SCOPE.

1.1. Scope. This specification describes a Trailer Mounted Welding Shop Set consisting of selected tools and equipment integrated with an enclosure mounted on a high mobility military trailer chassis. This self-contained shop set will enable Army maintenance personnel to perform a variety of welding processes for maintenance and repair of equipment in remote locations.

2. APPLICABLE DOCUMENTS

2.1. General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. This section lists documents related to integration of the equipment and enclosure with the trailer. Specifications related to the tools and other shop equipment are contained in Army drawing 04A040000. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be use in improving this document should be addressed to: HQ ARDEC, AMSTA-AR-EST, Rock Island IL 61299-7300.

AMSC N/A **FSC 4940**

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Attach 003

2.2. Government documents.

2.2.1. Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see paragraph 6.2).

SPECIFICATIONS

FEDERAL

A-A-1927	- Padlock
A-A-50271	- Plate, Identification

STANDARDS

FEDERAL

FED-STD-595	- Colors Used in Government Procurement

DEPARTMENT OF DEFENSE

MIL-STD-171	- Finishing of Wood and Metal Surfaces
MIL-STD-209	- Interface Standard for Lifting and Tiedown Provisions
MIL-STD-810	- Environmental Test Methods and Engineering Guidelines
MIL-STD-1179	- Lamps, Reflectors, and Associated Signaling Equipment for Military Vehicles

HANDBOOKS

NONE

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094).

2.2.2. Other Government documents, drawings and publications. The following other Government documents, drawings, and publications form a part of this document to extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

DRAWINGS

04A040000 Welding Shop Component List

2.3. Non-Government publications. The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents that are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation (see paragraph 6.2)

ACOUSTICAL SOCIETY OF AMERICA (ASA)

ASA S1.4 -Specification for Sound Level Meters

(Application for copies should be addressed to the Acoustical Society of America (ASA), 120 Wall Street, 32nd Floor, New York, NY 10005-3993.)

AMERICAN NATIONAL STANDARDS INSTITUTE

ANSI Z535.4 - Product Safety Signs and Labels

(Application for copies should be addressed to the American National Standards Institute, 11 W. 42nd Street, New York, New York 10036.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM E380 - Standard for Metric Practice
ASTM D975 - Standard Specification for Diesel Fuel Oils

(Application for copies should be addressed to the American Society for Testing and Materials,

DFP 381
100 Barr Harbor Drive, West Conshohocken, Pa 19428-2959.)

AMERICAN WELDING SOCIETY (AWS)

Welding Handbook

(Copies of this handbook are available from the American Welding Society, 550 NW LeJeune Road, P.O. Box 351040, Miami, FL 33135)

2.4. Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1. First article. When specified (see paragraph 6.2), a sample shall be subjected to first article inspection in accordance with paragraph 4.2.1.

3.2. Performance. The Trailer Mounted Welding Shop Set (TMWSS) shall be a self-contained, integrated unit equipped for safe performance of a variety of welding and welding-related processes. The TMWSS shall contain the tools, machinery, and expendable supplies necessary to perform these processes. The TMWSS shall also provide compressed air on demand, electrical power for lights and electric hand tools, and an illuminated work surface with a vise. The TMWSS shall contain the items specified in the Components List (Drawing 04A040000) along with any other equipment needed to fulfill these requirements. As appropriate, the shop components shall be mounted on the trailer and plumbed or wired as necessary to form an integrated, fully functional unit.

3.2.1. Arc welding processes. The TMWSS shall provide capability to perform these arc welding processes as defined by the AWS Welding Handbook: Shielded Metal Arc Welding (SMAW), Flux Cored Arc Welding (FCAW), Gas Tungsten Arc Welding (GTAW), and Air-Carbon Arc Cutting (AAC).

3.2.2. Oxy-fuel Gas Welding (OFW). The TMWSS shall provide capability to perform these OFW processes as defined by the AWS Welding Handbook: Oxy-fuel Gas Cutting (OFC) and Torch Brazing (TB).

3.2.3. Compressed air. The TMWSS shall provide compressed air on demand with sufficient pressure and volume for performing AAC. The combination of the compressor and the arc welding power source shall simultaneously provide at least 6 CFM of free air at 85 PSIG and a Constant Amperage arc of at least 200 A DC (100% duty cycle).

3.2.4. Operational distance. The TMWSS shall provide the capability to operate at least 50 feet away from the trailer. This includes operation of electric power tools and lights as well as conduct of all welding, brazing, and cutting processes.

3.2.5. Workbench. The TMWSS shall incorporate a shelf or similar structure to serve as a workbench.

3.2.5.1. Work surface. The workbench shall be at least 30 inches wide and 16 inches deep. The work surface shall be 36 ± 6 inches from ground level when the TMWSS is fully laden and prepared for operation. The work surface shall be resilient enough to withstand impacts typical of repair welding operations without sustaining damage, shall be non-flammable, and shall be resistant to damage from weld spatter.

3.2.5.2. Shelter. The workbench area shall be sheltered from sun and rain when in use.

3.2.5.3. Vise. The TMWSS shall provide a mount for the vise on or near the workbench. When mounted the vise shall have the full range of motion and uses anticipated by its design. When mounted the vise shall be afforded at least one position free of obstructions in the vertical plane of its jaws.

3.2.5.4. Strength. The workbench shall support a load of at least 250 pounds without being damaged. In addition, the vise mount and its supporting members (i.e. the workbench or other structure) shall be rigid enough and durable enough to withstand forces exerted on the vise without suffering damage or permanent deformation. They shall be capable of withstanding both clockwise and counter-clockwise torque of 100 foot pounds on each of the three axes of the vise while supporting the weight of the vise plus a 45 pound work piece.

3.2.5.5. Lighting. The TMWSS shall provide permanently mounted light(s) for the workbench. The workbench light(s) shall provide an illumination of at least 50 foot candles, as measured at the work surface. Illumination levels shall be as specified and light shall be so distributed as to minimize glare and specular reflection.

3.3. Inputs and interfaces.

3.3.1. Trailer. The TMWSS shall be installed on the chassis of a Trailer, Cargo: 2840 Pounds, 2-Wheel M1102, NSN 2330-01-387-5426, which will be supplied by the government.

3.3.1.1. Trailer modification. The contractor may modify the M1102 Cargo Trailer as necessary to meet the requirements of this specification. This includes removal of the cargo body, modification of the wiring harness, and salvage of lights and other components from the cargo body for use on the TMWSS enclosure. Other modifications are also permitted, provided the safety and performance of the trailer chassis are not compromised.

3.3.1.2. Lights and reflectors. The modified trailer shall conform to MIL-STD-1179. The lights and reflectors installed on the trailer as provided by the government are in conformance with the military standard, and should be re-used. Any modification to or replacement for the trailer wiring harness shall maintain the separate circuitry for the blackout lights (see paragraph 6.5).

3.3.2. Size. The overall dimensions of the TMWSS when ready for towing shall not exceed 96

inches high, 86 inches wide, and 132 inches long. The length of the enclosure when closed for towing shall not exceed 91 inches and shall not overhang either end of the trailer bed.

3.3.3. Human interface. The TMWSS shall be suitable for operation and maintenance by the majority of U.S. Army personnel in accordance with Appendix A.

3.3.3.1. Task loading. The shop shall be easy to set up for operation and to prepare for storage and transportation. Setup and operation of the TMWSS shall not require more than one person.

3.3.3.2. Protective clothing. The TMWSS shall be operable and maintainable by personnel wearing heavy gloves suitable for cold weather.

3.3.3.3. Storage.

3.3.3.3.1 Easy access. All equipment and expendable supplies stored within the TMWSS shall be accessible by personnel standing on the ground next to the TMWSS in accordance with Appendix A.

3.3.3.3.2 Free movement. The TMWSS enclosure doors and storage areas shall minimize impediments to the operator, and minimize interference with use of the shop caused by obstacles (e.g. rocks, posts, and trees) standing within three feet of the trailer sides.

3.3.3.3.3 Organized storage. Each item carried in the TMWSS shall have a specifically designated storage location.

3.3.3.3.4 Proximate storage. Items normally used together shall be stored in the same area of the TMWSS enclosure.

3.3.3.3.5 Linear products. Flexible linear products more than ten feet long, such as hoses and electrical cables, shall be stored on self-winding reels.

3.3.3.3.6 Visual cues. The storage method used for each item shall provide the operator a visual cue when an item is not in its designated storage location.

3.3.3.3.7 Rapid inventory. The design of the TMWSS shall facilitate rapid inventory. The storage methods employed should enable the operator to verify within fifteen minutes or less that all items are present and secured in their designated storage locations. In the event an item is absent from the shop, the operator shall be provided with the means to identify the specific item by name and description. It is desired that any missing item be identifiable within one minute.

3.3.4. Plates and labels. All identification, warning, and instruction plates and labels shall be permanently affixed to the TMWSS. They shall be resistant to deterioration caused by heat, cold, solar radiation, water, and petroleum products to the extent that they will remain intact and readily legible for the expected economic life of the TMWSS. Marking shall be accomplished in a manner that does not adversely affect the life and utility of the TMWSS or its equipment. All plates and labels shall be printed in the English language, and may be supplemented by graphical symbols.

3.3.4.1. Item identification. Each TMWSS shall be identified with by a plate conforming to A-A-50271, Composition A, Class 2 or Composition D, and containing the following data. The item

identification shall be placed in a location on the exterior of the TMWSS that is plainly visible when the TMWSS enclosure has been closed in preparation for shipment or storage.

a. Nomenclature: Shop Equipment, Welding
b. NSN: 4940-01-454-9877
c. LIN: W48391
d. Specification data: DFP 381
e. Manufacturer: CAGE or NSCM and PIN **
f. Serial Number: *
g. Acquisition instrument identification number: **

* Format optional
** See definitions

3.3.4.2. Shipping data. A shipping data plate shall be furnished and shall conform to A-A-50271, Composition A, Class 2 or composition D. Silhouettes of the TMWSS in transport configuration which indicate the center of gravity of the fully-loaded shop along each axis as well as the locations of the lifting and tiedown provisions shall be included on the data plate. The item identification shall be placed in a location on the exterior of the TMWSS that is plainly visible when the TMWSS enclosure has been closed in preparation for shipment or storage.

3.3.4.3. Hazard identification. Unguarded physical hazards (see paragraph 3.6.1) shall be identified. Product safety signs and labels shall conform to ANSI Z535.4.

3.3.4.3.1 Noise Hazards. If the steady-state noise produced by the arc welding power source in any mode of operation exceeds 85 decibels (dB) on the A-weighted scale, noise hazard caution signs shall be posted on the arc welding power source in conspicuous locations (see paragraph 3.6.6).

3.3.4.3.2 Lift hazards. Caution signs shall be provided for stored items that exceed the safe limits for a single person to lift using both hands (see Appendix A).

3.4. Environment.

3.4.1. Operational environment. The TMWSS shall operate in climatic design types hot, basic, and cold as defined by MIL-STD-810. It must operate under all adverse weather conditions of these climatic design types, excluding rain.

3.4.1.1. Operating temperatures. The TMWSS shall operate when conditioned to air temperatures from -25 °F to +120 °F, inclusive.

3.4.2. Storage environment. The TMWSS shall withstand outdoor storage in climatic design types hot, basic, and cold as defined by MIL-STD-810 without sustaining damage to the enclosure or any equipment stored within it. The TMWSS will be stored with all equipment and expendable supplies stowed in their designated positions, and all panels and doors closed

3.4.2.1. Storage temperatures. The TMWSS shall withstand storage in all air temperatures from -50 °F to +160 °F, inclusive.

3.4.2.2. Weather protection. The TMWSS enclosure shall protect its contents from rain; from accumulations of ice and snow; and, when being towed, from accumulations of road dirt and mud. The enclosure need not be equipped with watertight seals provided the equipment and supplies it contains do not get wet and the water drains from the enclosure. The enclosure shall be vented to permit air circulation during storage.

3.4.3. Fungus and moisture. The TMWSS electrical circuits and components shall be composed of inherently fungus and moisture resistant materials, or shall be protected from fungus and moisture damage by protective coating(s) or hermetic seal(s). All hoses, electric cable covers and other elastomeric parts that are exposed to air shall be fungus resistant.

3.4.4. Ozone. All hoses, electric cable covers and other elastomeric parts exposed to air shall be ozone resistant.

3.4.5. Storage restraints. Straps, brackets, clamps, or other devices shall be provided to assure that all stowed items remain securely in place and are protected from damage during transportation.

3.5. Enclosure. The TMWSS equipment and supplies shall be mounted in a lockable enclosure suitable for discouraging tampering, unauthorized use of the TMWSS, and theft of TMWSS components.

3.5.1. Storage. The TMWSS shall have integral storage compartments suitable for stowing all equipment, publications, and expendable supplies during transportation, storage, and periods of non-use.

3.5.2. Physical security.

3.5.2.1. Locks. Locking of the enclosure shall be accomplished with key-operated, tumbler-type padlocks conforming to CID A-A-1927, Type I, Size B. The locks shall have double dead-bolt construction, which engages the shackle at both toe and heel. The number of locks required to secure each TMWSS shall not exceed six. If multiple locks are used, the set of locks for each TMWSS shall be keyed alike, and the keys used for one set shall not work for any other set. No master or grand master keys shall be provided. Each padlock shall be permanently attached to the TMWSS enclosure with a brass chain at least nine inches in length. (see paragraph 6.6)

3.5.2.2. Anti-tampering measures. When prepared for towing and storage, the padlocks on the enclosure shall be plainly visible. It shall not be possible to use or remove any of the equipment stored in the enclosure without either removing the locks or visibly damaging the enclosure.

3.5.2.3. Loss and damage prevention. All doors, panels, and other covers for openings in the TMWSS enclosure shall be permanently affixed to the enclosure. Doors and panels shall be contained in the enclosure or lie flat against it when open.

3.5.3. Protective coloration. Unless otherwise specified (see paragraph 6.2.1), the color of the exterior of the enclosure shall approximate Lusterless Forest Green 34083 of FED-STD 595. The

interior surfaces of the enclosure shall approximate Semi-gloss Green 24533 or Semi-Gloss White 27875 of FED-STD-595.

3.6. Safety. The TMWSS shall not present any uncontrolled safety or health hazards throughout the life cycle of the system. The TMWSS shall incorporate the following features to assure safe operation.

3.6.1. Physical hazard control. Mechanical guards, electrical insulation, thermal insulation, and other safety devices shall be provided to protect operators and maintenance personnel from inadvertent contact with moving parts, electrically energized parts, high temperature surfaces, and other physical hazards (see Appendix A). The safety devices shall not interfere with operation of the TMWSS. Exposed sharp corners and sharp edges on TMWSS parts shall be eliminated if they serve no functional purpose. Hazards that cannot be eliminated, cannot be controlled by equipment placement, and cannot be controlled by protective devices shall be identified to the user by printed warnings or cautions.

3.6.2. Physical strain control. The physical exertion required to set up and operate the TMWSS shall not exceed safe limits for the target population. Caution signs (see paragraph 3.3.4.3) shall be provided for stored items that exceed the safe limits for manual lift (see MIL-STD-1472 for guidance, reference only).

3.6.3. Electrical ground. The arc welding power source and all electrical circuits incorporated in the enclosure shall be electrically grounded to the trailer frame. A threaded ¼ inch diameter grounding stud and compatible wing nut shall be provided in a clearly marked location on the exterior of the shop no more than three feet from ground level.

3.6.4. Stability. When set up for operation, the weight of the TMWSS shall be balanced on the chassis. The center of gravity shall be located such that, with the support legs removed from the trailer, a downward force of 200 pounds can be applied to the work surface without causing the trailer to tip. The location of the center of gravity shall also permit the TMWSS to be tilted in any direction at least fifteen degrees from the horizontal without falling over. The center of gravity shall remain within these limits whether the shop is fully loaded or unloaded (see paragraph 6.9.3).

3.6.5. Component restraints. Doors, drawers, and other moving parts of the enclosure and the storage system shall be provided with restraints as necessary to secure them in the open and closed positions. The restraints shall prevent unintended movement of the moving parts due to wind or placement of the TMWSS on a slope. Items stored in the TMWSS shall be provided with restraints to secure them in place (see paragraph 3.4.5). The restraints shall prevent the stored items from sliding or falling out of their storage locations when the TMWSS is placed on slopes of 15 degrees or less.

3.6.6. Welding curtains. The enclosure shall provide the means to secure welding curtains around the workbench.

3.6.7. Noxious fumes. There shall be adequate clear space above and below the welding curtains to prevent the accumulation of noxious fumes around the workbench. Engine exhaust from the arc welding power source shall be directed away from the workbench.

3.6.8. Noise control. The sound generated by the TMWSS shall be minimized (see paragraph 3.3.4.3.1 and 6.4).

3.7. Transportability. When prepared for towing and storage, the TMWSS shall be suitable for commercial shipment via air, sea, rail, and highway.

3.7.1. Shock and vibration. The TMWSS shall withstand the shocks and vibration associated with commercial shipment as secured cargo (see paragraph 6.9.4 definition) without sustaining damage or degradation in performance. During or following shipment, there shall be no damage to or displacement of any component, accessory, part, or tool installed in or on the shop (see paragraph 6.9.1), and no evidence of damage to the shop enclosure.

3.7.2. Lifting and tie down provisions. The TMWSS shall have lifting and tiedown provisions conforming to MIL-STD-209. Use of the existing lifting and tiedown provisions found on the M1102 trailer chassis is permitted, subject to the requirements of MIL-STD-209 for the complete TMWSS. If spreader bars are required to accommodate lift by cable sling, the enclosure shall incorporate integral spreader bars.

3.8. Towing. When closed and packed for storage, the TMWSS shall be suitable for towing by military vehicles.

3.8.1. Weight. The weight of the complete TMWSS when fully loaded shall not exceed the trailer chassis Gross Vehicle Weight Rating (GVWR) of 4,200 lbs.

3.8.2. Ground clearance. When fully laden, the TMWSS shall have a ground clearance of at least sixteen inches, which is the ground clearance of the trailer as originally supplied by the government.

3.8.3. Balance. When prepared for storage, the weight of TMWSS shall be balanced on the chassis. The center of gravity shall be within three inches of the longitudinal centerline of the trailer (i.e. it shall be centered between the wheels). The center of gravity shall be forward of the trailer axle such that the pintle load is no less than five percent and no more than fifteen percent of the actual gross weight of the shop. The center of gravity shall remain within these limits whether or not the shop is fully loaded.

3.8.4. Roadability. The TMWSS shall have the durability to withstand being towed at least 2000 miles over rough surfaces, including secondary roads, cobblestone roads, washboard, and cross-country travel. Towing shall not cause damage to or displacement of any component, accessory, part, or tool installed in or on the shop, shall not damage the shop enclosure, and shall not damage the trailer.

3.9. Durability. The TMWSS shall have a projected economic life of not less than ten years.

3.10. Ease of maintenance.

3.10.1. Access. It shall be possible for the majority of Army personnel to perform routine maintenance on the arc welding power source without removing the power source from the trailer, and without removing or disassembling any part of the trailer or enclosure (see Appendix A). Typical routine maintenance tasks: filling the fuel tank; changing the engine oil and filter;

changing the engine coolant; replacing the air filter; replacing the fuel filter; checking and filling the battery, and cleaning the arc welding power source with low-pressure compressed air.

3.10.2. Fastening devices. Screws, pins, bolts, and similar parts shall be installed with means for preventing loss of tightness. The methods for preventing loss of tightness shall be according to accepted engineering standards and practices. No such parts subject to removal or adjustment shall be swaged, staked, or otherwise deformed.

3.10.3. Cleaning. The enclosure shall be washable inside and out. Any features within the enclosure that could become collection points for water shall be provided with drain holes.

3.10.4. Decontamination. The TMWSS enclosure shall be nuclear, biological and chemical (NBC) contamination survivable. In essence, this means the materials used shall not absorb biological or chemical agents, and that they shall not be damaged by the steam and strong bleaching agents used for decontamination. This is a military–unique requirement. The equipment and expendable supplies loaded in the shop need not be NBC contamination survivable.

3.10.5. Protective finish. Metal parts shall be plated or painted to protect them from corrosion. *Cleaning, treating, and painting of the TMWSS trailer and enclosure shall conform to the* requirements of MIL-STD-171, finish 7.3.1 plus 20.24 (Chemical Agent Resistant Coating (CARC)) for aluminum, and finish 5.1.1 plus 20.24 for ferrous metals (see paragraph 3.10.4).

4. VERIFICATION

4.1 General provisions. The inspections (examinations and tests) herein shall be performed to determine whether the item conforms to Section 3 of this specification.

4.1.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. First article inspection (see 4.2)
b. Conformance inspection (see 4.3)

4.1.2 Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with the test conditions specified herein.

4.2 First article inspection.

4.2.1 Submission. The contractor shall submit a first article sample as designated by the Contracting Officer for evaluation in accordance with the specified verification methods of Table I. The first article inspection shall consist of a minimum of 1 complete TMWSS (see 6.2).

4.2.2 Inspections to be performed. As determined by the Government, the first article assemblies, components and test specimens may be subjected to any or all of the verification methods specified (see Table I). Unless otherwise specified all the inspections shall be performed.

4.2.3 Rejection. If any test assemblies, test specimen or test components fails to comply with any of the applicable requirements, the first article sample shall be rejected. The Government reserves the right to terminate inspection upon any failure of a test assembly, specimen or component to comply with any of the requirements.

4.3 Conformance inspection.

4.3.1 Compliance. Conformance inspections shall be applied to production units being offered for acceptance under the contract. These inspections shall include all verifications listed in Table I.

4.3.2 Inspection lot formation. Lot formation shall be in accordance with Section 4 of MIL-STD-1916.

4.3.3 Sampling plan determination. Conformance verification methods are specified in Table I. When required by contract or cited herein, attribute sampling inspections shall be conducted in accordance with MIL-STD-1916 using verification levels specified in the contract or purchase order.

4.3.4 Rejection. Failure of any unit to pass any verification shall be cause for rejection of the unit.

4.4 Preparation. Prepare the TMWSS for testing by performing normal service, lubrication, and adjustment as recommended by the manufacturer. Prepare the arc welding power source and air compressor for testing by performing normal service, lubrication, and adjustment as recommended by the manufacturer for operation under the test conditions. This specifically includes the use of fuel and lubricants tailored for the temperature conditions encountered in each test. When tested, the arc welding power source shall be burning ASTM D975 Grade Low Sulfur No. 1-D or 2-D Diesel Fuel (see paragraph 6.3).

4.5 Performance. Inventory the TMWSS for the tools, machinery, and related supplies as specified in Drawing 04A040000, Welding Shop Component List and certify all are in place.

4.6 Arc welding process. Function the TMWSS showing successful performance of: Shielded Metal Arc Welding, Flux Cored Arc Welding, Gas Tungsten Arc Welding, and Air-Carbon Arc Cutting.

4.6.1 Oxyfuel gas welding. Function the TMWSS showing successful performance of Oxyfuel Gas Cutting and Torch Brazing.

4.6.2 Compressed air. Function the TMWSS demonstrating, simultaneously operating the compressor delivering not less than 6 CFM of air at 85 PSIG and the arc welding source providing a constant amperage arc of not less than 200A DC for a 100% (10 minutes) duty cycle.

4.7 Operational distance. In an area simulating an operational scenario demonstrate that there is power to, and supplies available for performing welding, brazing and cutting operations at a distance not less than 50 feet from the TMWSS. Repeat the demonstration using the electric tools.

4.8 Workbench. Verify an incorporated workbench is part of and within the TMWSS.

4.8.1 Work surface. Measure the work surface dimensions and its distance from ground level. The surface shall not be less than 30 inches wide and 16 inches deep. The work surface shall be 36 $\pm$ 6 inches from ground level when the TMWSS is fully laden and prepared for operation. With a 20-oz striking hammer, apply several impacts, typical of repair shop operation, to various areas of the work surface. The work surface shall have no measurable distortions as a result of the hammer blows. Using the TMWSS's self contained equipment, apply a low intensity flame from one of the cutting torches to the work surface, it shall be nonflammable. Repeat using any of the welding processes and allow a weld spatter to moderately cover the work surface. The work surface shall not show any permanent damage as a result of the spatter.

4.8.2 Shelter. With the TMWSS in a test area and in a use mode, demonstrate that the workbench and the supporting work area are sheltered from the sun. Keeping the same sheltered area provide a moderate rainfall onto the TMWSS, examine the workbench and its work area for adequate rain protection.

4.8.3 Vise. Confirm that a vise rotational through 360° in a plane parallel to the ground is located on or near the workbench. In the jaws of the vise fasten a rod not less than 4 feet in length perpendicular to the workbench surface. Rotate the vice one complete revolution and verify there no vertical obstruction exist.

4.8.3.1 Vise mount. A test weight simulating a work piece shall be clamped in the jaws of the vice. The test weight shall weigh not less than 45 pounds and have means to attach a standard torque wrench. Apply a 100 foot-pound torque to the test weight, first clockwise, then counterclockwise in planes that are parallel to and perpendicular to the horizontal centerline of the TMWSS. There shall be no visible permanent deformation to the vise or its supporting members after the application of any of the applied forces.

4.8.4 Workbench load support. Place a dead weight of not less than 250 pounds on the workbench surface and let it rest for not less than 2 minutes. Move the dead weight to not less than 3 other positions on the surface and repeat. The dead weight shall not cover a surface area greater than 120 square inches at any time. There shall be no visible permanent deformation to the workbench.

4.8.5 Workbench illumination. Illuminate the workbench surface using only the workbench

light(s). Measure the light intensity on the workbench surface with an illuminance meter. Confirm there is not less than 50-foot candles of illumination over the entire surface of the workbench, and that glare and specular reflection do not reduce work efficiencies.

4.9 Trailers and interface.

4.9.1 Trailer. *Examine the Government furnished Trailer. Verify it is an M1102 and totally* described by NSN 2330-01-387-5426.

4.9.1.1 Trailer modifications. Verify that permanent documentation exist for any contractor made trailer modifications.

4.9.2 Lights and reflectors. Confirm that any contractor made modifications to the lamps, reflectors, or associated signaling equipment on the M1102 Trailer conform to MIL-STD-1179.

4.10 Size. Put the TMWSS in its towing mode. The enclosure, lengthwise, shall not overhang either end of the trailer. Measure the overall dimensions of the TMWSS enclosure. The height shall not be greater than 96 inches, its width not greater than 86 inches and its length not greater than 91 inches.

4.11 Human interface. Using operators to meet the anthropometry requirements of Appendix A (see A5.1.1) with hands encased in heavy cold weather gloves, demonstrate that the trailer mounted enclosure shall be readily set up for operation and its equipment and machinery easily accessible and operable. When finished demonstrate that the same operators can return all equipment to its storage location and prepare the trailer for towing.

4.11.1 Easy access. Using operators to meet the anthropometry requirements of Appendix A (see A 5.1.1) with hands encased in heavy cold weather gloves, demonstrate that all equipment and supplies stored within the TMWSS shall be accessible while standing on the ground.

4.12 Free movement. With the TMWSS in a test area and in a use mode, establish a 3 foot work perimeter. Demonstrate that all enclosure doors can be completely opened within the perimeter.

4.13 Storage.

4.13.1 Organization. Survey each item carried by the TMWSS and verify each has a designated storage location with each location having a visible cue when the item is not in storage. Also, verify that items used together are stored in the same area.

4.13.2 Flexible linear tools. Examine all stored flexible linear products. Confirm that all whose length is 10 feet or greater are stored on self-winding reels.

4.13.3 Rapid inventory. With all items in their storage locations, measure the time required to have 1 operator inventory the TMWSS for all its tools, machinery, and related supplies being present and secured in their proper location. The measured time shall not be greater than15 minutes. Any missing item shall be identifiable by name and description within 1 minute.

4.14 Plates and labels. Examine all plates and labels affixed to the TMWSS, affirming them to be in the English language. Examine all plate and label material specification sheets, including marking, engraving techniques, verifying they are resistant to all environmental elements and petroleum products and will remain legible for 10 years.

4.15 TMWSS identification plate. Locate the TMWSS's identification plate. Verify it is in a plainly visible area and that it contains the informational and material requirements of 3.3.4.1.

4.15.1 TMWSS shipping data plate. Locate the TMWSS's shipping data plate. Confirm it to be plainly visible when the TMWSS is in a shipping or storage condition. Verify that it contains the informational and material requirements of 3.3.4.2.

4.15.2 Hazard identification. In an operational mode, examine the TMWSS for all unguarded physical hazards (see 3.6.1) and verify that all are properly identified and labeled in accordance with ANSI Z535.4.

4.16 Noise hazards. The noise generated by the TMWSS while being operated in a free field shall be measured in all operating modes. Measurements shall be made on the A scale at slow response on a sound level meter meeting the Type I requirements of ANSI/ASA S1.4. Establish a steady state 85 dB (A) contour surrounding the TMWSS by measuring at not less than 8 locations, at a height of 5 feet above the ground plane at angular increments of not more than 45 degrees from the noise source. The maximum distance at which 85 dB (A) is obtained shall be indicated on a noise hazard caution sign posted on the TMWSS. If the steady-state noise level produced by the TMWSS is less than 85 dB (A) objective evidence must be presented for the elimination of the noise hazard caution sign.

4.17 Lift hazards. To determine compliance with the Design Weight Limits of MIL-STD 1472 caution signs shall be placed on all stored items exceeding those weight limit requirements.

4.18 Environment.

4.18.1 High temperature operation. The TMWSS shall be tested in accordance with MIL-STD-*810, Method 505.3, Procedure I. Temperature/solar radiation cycling shall be in accordance with* Table 505.3-I. The number of Hot-Dry cycles shall be three. Every hour, all panels and doors shall be opened and closed at least once, and the arc welding power source and air compressor shall be operated for not less than 10 minutes at their full rated outputs. The power source full rated output may be achieved by welding or by application of a resistive load in addition to the

power consumed by the air compressor. The test operator shall adhere to the duty cycle recommended by the power source manufacturer for operation at that temperature. Overheating of the arc welding power source; binding of the enclosure doors or panels; or deterioration of the enclosure materials, electric cables, or gas hoses shall be cause for rejection.

4.18.2 Cold temperature operation. The TMWSS shall be tested in accordance with MIL-STD-810, Method 502.3, Procedures II and III. The TMWSS shall be placed in an environment with an ambient temperature of -25°F or lower until all its components have cooled to a temperature not greater than -25°F. The TMWSS shall be maintained at a temperature not greater than -25°F for not less than 4 hours. Every hour, all panels and doors shall be opened and closed at least once, and the arc welding power source and air compressor shall be operated for not less than 10 minutes at their full rated outputs. The rated power source output may be achieved by welding or by application of a resistive load in addition to the power consumed by the air compressor. Inability to operate the arc welding power source or air compressor; cracking, crazing, embrittlement, or other damage to the enclosure materials, electrical cables, or gas hoses; or binding of any door, panel, or other part of the enclosure shall be cause for rejection.

4.18.3 High temperature storage. The TMWSS shall be tested in accordance with MIL-STD-810, Method 501.3, Procedure I – Storage. Temperature cycling shall be in accordance with Table 501.3-I, Induced Conditions, number of cycles 7. Inability to operate the arc welding power source or air compressor following the test; damage to the enclosure materials, electrical cables, or gas hoses; or binding of any door, panel, or other part of the enclosure shall be cause for rejection.

4.18.4 Cold temperature storage. The TMWSS shall be tested in accordance with MIL-STD-810, Method 502.3, Procedure I. The TMWSS shall be placed in an environment with an ambient temperature not greater than -50°F until all its components have cooled to that temperature. The TMWSS shall be maintained at that for not less than 72 hours. Immediately after cold temperature conditioning operate the arc welding power source and the air compressor verifying they meet their rated outputs. Examine all enclosure materials, electric cables, gas hoses for cracking, crazing, embrittlement, or other damage, which shall be cause for rejection. The binding of any door, panel, or other part of the enclosure shall also be cause for rejection.

4.18.5 Weather protection. The TMWSS shall be tested in accordance with MIL-STD-810, Method 506.3, Procedure III. During the test, all items shall be in their storage locations and all doors and panels shall be closed and locked. Immediately following the test open all doors and panels. Any evidence of water on any stored item shall be cause for rejection. Any pooling of water in any cavity of the TMWSS or the creation of any electrically hazard shall be cause for rejection. Operate the arc welding power source and the air compressor verifying they meet their rated outputs

4.18.5.1 Ventilation. Examine the TMWSS and verify that it is vented when in the storage mode.

4.18.6 Fungus and moisture. Fungus and moisture. The supplier shall provide Certificates of Conformance (COC) that all materials used in the TMWSS's electrical circuits and related components, all hoses, cable covers and other elastomer parts are fungi and moisture resistant. At a minimum the supplied COC shall reference the methods used in determining the fungus and moisture resistant qualities.

4.18.7 Ozone. Examine the material specifications of all hoses, electric cable covers, and other elastomeric parts exposed to the atmosphere. Verify all materials are ozone resistant.

4.19 Enclosure requirements. Verify the TMWSS enclosure is lockable and contains integral storage compartments for expendable supplies. Confirm the enclosure contains straps, clamps, or other devices to keep all stowed items securely in during transportation.

4.20 Physical security.

4.20.1 Padlocks. Confirm the TMWSS's padlocks are in accordance with Commercial Item Description A-A-1927, Type I, Size B with the padlocks furnished for each individual TMWSS being a group and each group not exceeding 6 padlocks. Verify that each group is keyed alike with no two groups being keyed alike.

4.20.1.1 Padlock chains. Verify that each padlock has affixed a permanent chain not less than 9 inches.

4.20.2 Visibility. With the TMWSS in the towing or storage mode and all padlocks locked, verify all padlocks are plainly visible and no stored equipment is accessible.

4.20.3 Doors and panels. Verify all doors and panels are permanently affixed to the enclosure and, when in the open position, are within the enclosure or lie flat against its sides.

4.21 Color. In accordance with FED-STD-595 and using color swatches compare the exterior color of the enclosure for conformance with Lusterless Forest Green 34083 and the interior surfaces for conformance with Semi-gloss Green 24533 or Semi-Gloss White 27875.

4.22 Safety.

4.22.1 Physical hazard control. Examine the TMWSS and confirm all moving parts, electrically energized parts, and high temperature surfaces are provided with guard, covers, or insulation to protect personnel from inadvertent contact. Also, confirm that no safety guards, covers, and insulation interfere with the operation of the TMWSS.